

What is claimed is:

1. A targeted therapeutic or diagnostic agent comprising (a) a therapeutic or diagnostic functional entity linked to (b) an isolated peptide mimetic that specifically binds a selected target.
2. A targeted therapeutic or diagnostic agent comprising (a) a therapeutic or diagnostic functional entity linked to (b) an isolated, optimized, high-affinity polyamino acid that specifically binds a selected target.
- 10 3. A targeted therapeutic or diagnostic agent comprising (a) a therapeutic or diagnostic functional entity linked to (b) an isolated naturally occurring or optimized protein surface loop that specifically binds a selected target, wherein the protein surface loop is not endogenous to the functional entity.
- 15 4. The targeted agent of any of claims 1, 2 or 3, wherein the functional entity is a medical or diagnostic device.
- 20 5. The targeted agent of any of claims 1, 2 or 3, wherein the entity is a cell, virus, gene delivery vehicle or a biological molecule.
- 25 6. The targeted agent of any of claims 1, 2 or 3, wherein the entity is a synthetic or naturally occurring macromolecule.
7. The targeted agent of any of claims 1, 2 or 3, wherein the entity is a synthetic or naturally occurring peptide or protein.
- 30 8. The targeted agent of any of claims 1, 2 or 3, wherein the entity is a synthetic or naturally occurring enzyme.

9. The targeted agent of any of claims 1, 2 or 3, wherein the entity is a thrombolytic agent or an anticoagulant.
10. The targeted agent of any of claims 1, 2 or 3, wherein the entity is a plasminogen activator.
11. The targeted agent of any of claims 1, 2 or 3, wherein the entity is tissue type plasminogen activator (tPA), or a variant of tissue type plasminogen activator.
12. The targeted agent of any of claims 1, 2 or 3, wherein the entity is loop-grafted tissue type plasminogen activator (LG-tPA).
13. The targeted agent of any of claims 1, 2 or 3, wherein the target is a biological entity.
14. The targeted agent of any of claims 1, 2 or 3, wherein the target is an organ, tumor, tissue, cell, virus, or microorganism.
15. The targeted agent of any of claims 1, 2 or 3, wherein the target is a synthetic or naturally occurring macromolecule.
16. The targeted agent of any of claims 1, 2 or 3, wherein the target is a protein.
17. The targeted agent of any of claims 1, 2 or 3, wherein the target is a cell surface protein.
18. The targeted agent of any of claims 1, 2 or 3, wherein the target is an integrin.

19. The targeted agent of any of claims 1, 2 or 3, wherein the target is an integrin that binds to an Arg-Gly-Asp (RGD) tripeptide motif.
20. The targeted agent of any of claims 1, 2 or 3, wherein the target is $\alpha_1\beta_1$ integrin.
21. The targeted agent of any of claims 1, 2 or 3, wherein the target is $\alpha_v\beta_1$ integrin.
22. The targeted agent of claim 2, wherein the optimized, high affinity polyamino acid is a complementarity determining region of an IgG-like molecule.
23. The targeted agent of claim 2, wherein the optimized, high affinity polyamino acid is a complementarity determining region of an antibody molecule.
24. The targeted agent of claim 23, wherein the complementarity determining region is heavy chain complementarity determining region 3 (HCDR3) of monoclonal antibody Fab-9.
25. A recombinant targeting protein comprising (a) a surface loop from a first protein having a surface loop that specifically binds the target and (b) a functional domain of a second protein.
26. The recombinant targeting protein of claim 25, wherein the surface loop is a complementarity determining region of a monoclonal antibody directed against the target.
27. The recombinant targeting protein of claim 26, wherein the antibody is directed against a cell surface protein.

28. The recombinant targeting protein of claim 27, wherein the cell surface protein is an integrin.
29. The recombinant targeting protein of claim 28, wherein the integrin is platelet glycoprotein GPIIb/IIIa (integrin $\alpha_I I b\beta_I$).
30. The recombinant targeting protein of claim 28, wherein the integrin is $\alpha_v\beta_I$.
31. The recombinant targeting protein of claim 29 or 30, wherein the surface loop is the HCDR3 of monoclonal antibody Fab-9.
32. The recombinant targeting protein of claim 25, wherein the second protein is human tissue type plasminogen activator (t-PA).
33. The recombinant targeting protein of claim 25, wherein the surface loop is the HCDR3 of monoclonal antibody Fab-9, the second protein is human tissue type plasminogen activator (t-PA), and the target is platelet glycoprotein GPIIb/IIIa (integrin $\alpha_I I b\beta_I$).
34. A composition comprising the recombinant targeting protein of claim 25.
35. The composition of claim 34, further comprising a pharmaceutically acceptable carrier.
36. A composition comprising the recombinant targeting protein of claim 33.
37. The composition of claim 36, further comprising a pharmaceutically acceptable carrier.
38. An isolated nucleic acid encoding the recombinant protein of claim 25.

39. An isolated nucleic acid encoding the recombinant protein of claim 33.
40. An isolated nucleic acid that specifically hybridizes to the nucleic acid of claim 38.
- 5 41. An isolated nucleic acid that specifically hybridizes to the nucleic acid of claim 39.
42. A composition comprising the nucleic acid of claim 38.
- 10 43. The composition of claim 42, further comprising a pharmaceutically acceptable carrier.
44. A composition comprising the nucleic acid of claim 39.
- 15 45. The composition of claim 44, further comprising a pharmaceutically acceptable carrier.
- 20 46. A method of reducing a blood clot in a subject comprising administering to the subject a therapeutic amount of the protein of claim 33, thereby binding the protein to platelet glycoprotein GPIIb/IIIa (integrin α I I b β I) on a platelet in a blood clot in the subject and reducing the blood clot in the subject.
- 25 47. A method of preventing thrombosis or promoting thrombolysis in a subject comprising administering to the subject a therapeutic amount of the protein of claim 33, thereby binding the protein to platelet glycoprotein GPIIb/IIIa (integrin α I I b β I) on a platelet in a blood clot in the subject and preventing thrombosis or promoting thrombolysis in the subject.
- 30 48. A method of treating or preventing myocardial infarction in a subject comprising administering to the subject a therapeutic amount of the protein

of claim 33, thereby binding the protein to a platelet in the subject and treating or preventing myocardial infarction in the subject.

49. A method of targeting a therapeutic compound to a tumor in a subject
5 comprising administering to the subject the targeted agent of claim 24,
wherein the therapeutic or diagnostic entity is an anti-tumor therapeutic
compound.
50. A method of targeting a therapeutic protein to a tumor in a subject
10 comprising administering to the subject the protein of claim 31, wherein the
second protein is an anti-tumor therapeutic protein.
51. A method of targeting a therapeutic compound to an osteoclast in a subject
15 comprising administering to the subject the targeted agent of claim 24,
wherein the therapeutic or diagnostic entity is an anti-osteoporosis
therapeutic compound.
52. A method of targeting a therapeutic protein to an osteoclast in a subject
20 comprising administering to the subject the protein of claim 31, wherein the
second protein is an anti-osteoporosis therapeutic protein.
53. A method of targeting a therapeutic compound to an endothelial cell which is
25 in the process of angiogenesis in a subject comprising administering to the
subject the targeted agent of claim 24, wherein the therapeutic or diagnostic
entity is an anti-angiogenic factor or a cellular poison.
54. A method of targeting a therapeutic compound to a tumor or tumor cell
30 expressing $\alpha_v\beta_3$ integrin in a subject comprising administering to the subject
the targeted agent of claim 24, wherein the therapeutic or diagnostic entity is
a cell with anti-tumor activity.

55. A method of targeting a therapeutic compound to a vascular smooth muscle cell (SMC) which is contributing to vascular stenosis in a subject comprising administering to the subject the targeted agent of claim 24, wherein the therapeutic or diagnostic entity is a modulator of cell growth or a cellular poison.

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